Toward closer cohesion of international tax statistics

The ICTD/UNU-WIDER GRD 2017

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Abstract: The Government Revenue Dataset (GRD) was launched in September 2014 and, in the few years since, has gone on to be recognized as the go-to source for researchers and policymakers seeking cross-country data on government revenues and taxes. However, as with any such project, successive rounds of updates have led to new challenges. This paper describes in depth some of the changes compared to older versions of the GRD, which are the result of learning during the update process, user feedback and changes to the underlying source data. It is not the intention to repeat the original motivations behind the dataset; these are covered in depth in Prichard et al. (2014). Particular attention is paid to the nuances of (i) how social security contributions are recorded in the OECD Revenue Statistics and IMF's Government Finance Statistics (GFS) (ii) the treatment of VAT or excises collected on imports and the classification of some property taxes.

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1   Introduction

Since its launch in September 2014, the ICTD / UNU-WIDER Government Revenue Dataset has quickly gained prominence as the go-to source for cross-country revenue data for many analyses. It has helped researchers to tackle questions not previously possible, or to extend and challenge existing beliefs about the macroeconomic impacts of tax policy.[1] Since the outset, one of the pillars of the project was transparency in the methods and processes that went into the construction of the data – in itself a response to the lack of transparency surrounding previous efforts. With this in mind, this paper serves to explain some of the recent improvements in the GRD. These improvements result from (i) changes in the underlying data sources (ii) user feedback and (iii) the development of a deeper understanding of how best to synthesize the data from various sources. It is hoped that this paper will also appeal more broadly to researchers utilizing government revenue statistics and, indeed, serve as a primer to understanding some of the complexities that persist when comparing data across countries, sources or both. The biggest issue considered – the discussion of social security contributions – is mainly relevant for OECD countries, whilst the others are more applicable to a wider range of countries. It is not the intention to discuss here the initial motivations behind the construction of the dataset, or to repeat any of what is discussed in Prichard *et al.*, (2014) in which it was introduced. The paper proceeds as follows. Section 2 discusses some issues with social contributions, providing examples of where cross-country comparisons can run into difficulties. Section 3 discusses recent changes to the classification of property taxes, whilst section 4 discusses the treatment of VAT on imports. Section 5 briefly reminds users of the importance of the notes and flags in the GRD. Section 6 concludes.

2   Social contributions

One of the important clarifications that the GRD makes is to present government revenue data both *inclusive* and *exclusive* of social security contributions. Accounting for social contributions can be quite challenging when comparing international sources on tax data, as different datasets often present these in different ways. This is particularly problematic when comparing the OECD's *Revenue Statistics* and the IMF's Government Finance Statistics (GFS), where the former includes social contributions as a subcomponent of total taxation, but the latter does not.[2,3] This first inconsistency is relatively straightforward to correct: the GRD expresses total tax both inclusive and exclusive of social contributions, so we simply *subtract* social contributions from tax in OECD *Revenue Statistics* and *add* them to tax in the GFS, in order to arrive at both figures from both sources. However, closer inspection of the two series has led to the identification of a number of further inconsistencies. The

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[1] See, for example, Morrissey *et al.* (2014) and Clist (2016) on aid and taxation, or McNabb (2016) on tax structures and economic growth.

[2] See Appendix 1 for an overview of the main differences between the two sources and how the GRD overcomes these.

[3] GFS statistics compiled according the GFSM1986 *did* include social contributions as an element of tax but those compiled according to either GFSM2001 or GFSM2014 do not.

first main issue is purely definitional, whilst the second is deeper-rooted and concerns (i) how governments report their data and (ii) how it is presented by the respective international organisations. In both cases, the investigation has necessitated that changes be made to the existing approach of the GRD, and these are outlined in detail below in sections 2.1 and 2.2 respectively. Section 2.3 discusses a number of additional problems with the recording of social contributions across countries that affect cross-country comparisons.

2.1 'Social Security Contributions' and 'Other Social Contributions'.

The OECD's *Revenue Statistics* (OECD 2017) classify Social Contributions as follows:

> 2000 Social Security Contributions
>
>> 2100 Employees SSC
>>
>> 2200 Employers SSC
>>
>> 2300 Self-Employed or Non-Employed SSC
>>
>> 2400 Unallocable

whilst the IMF GFS Manual (GFSM) (IMF, 2014) classification is as follows:

> 12 Social Contributions
>
>> 121 Social Security Contributions
>>
>>> 1211 Employees contributions
>>>
>>> 1212 Employers contributions
>>>
>>> 1213 Self-Employed or Nonemployed contributions
>>>
>>> 1214 Unallocable
>>
>> 122 Other Social Contributions
>>
>>> 1221 Employee contributions
>>>
>>> 1222 Employer contributions
>>>
>>> 1223 Imputed contributions

The '2000' category of the OECD's *Revenue Statistics* corresponds to category 121 of the GFS. The result is that the 'Other Social Contributions' category in the GFS is not included in the OECD's measure of social security contributions. The OECD does, however include 'Other Social contributions' as separate revenue columns (they are named 'Voluntary Social Security Contributions' and 'Imputed Social Contributions'). Thus, in the name of ensuring cohesion between the two sources, the 2017 update of the GRD includes these two additional categories of social contributions where

OECD data is employed (i.e. Social Contributions in OECD data is now category 2000 + 'Voluntary Social Security Contributions' + 'Imputed social contributions'). Previous versions of the GRD did not do this: data from OECD simply included the figures from the '2000…' heading as above.

The OECD *Revenue Statistics* interpretive guide (OECD, 2017:329) even hints that making this transformation might be wise: 'n principle, this heading [2000] excludes voluntary contributions paid to social security schemes. When separately identifiable, these are shown in the memorandum item on the financing of social security benefits. In practice, however, they cannot always be separately identified from compulsory contributions, in which case they are included in this heading."

The quote suggests that whilst there are times where voluntary social contributions are separated from the '2000 Social Security Contributions' heading, there are others where the OECD figures do not do this. Thus, it might even be valid to make this correction when comparing social contributions figures *within* the OECD *Revenue Statistics*, as well as with figures from other datasets.

A comparison of the data highlights that this transformation results in social contributions figures matching a lot more closely between the two sources. For example, table 1 displays this for the United Kingdom 2006–10 (General Government). It is clear that the two totals (in bold) match very closely – indeed the social security contributions figures are identical between the two sources and the discrepancy arising from 'Other social contributions' is very small indeed. Such discrepancies do persist between the two sources; it is virtually impossible to harmonize all of these but they are often small in magnitude.[4] For many countries, the figures for 'Voluntary Social Security Contributions' and 'Imputed Social Contributions' are small, or zero. However, for others they can represent a fairly large chunk of revenue: e.g. in Portugal, they represent around 3 per cent of GDP.

Table 1. Comparison of Social contributions. UK 2006–10 General Government, Current GBP.

Year	OECD REVENUE STATISTICS					IMF GFS		
	2000 Social security contributions (SSC)	Voluntary social security contributions	Imputed social contributions	Voluntary + Imputed	2000 + (Voluntary + Imputed)	Social Contributions	Social security contributions (SSC)	Other Social Contributions
2006	£89,550m	£12,986m	£7,778m	£20,764m	£110,314m	£111,038m	£89,550m	£21,488m
2007	£93,210m	£13,645m	£8,489m	£22,134m	£115,344m	£116,107m	£93,210m	£22,897m

[4] Such discrepancies across sources would seem to be a result of the nuances of how each source allocates revenues to certain categories. Whilst for Social Contributions the discrepancy is small, for other taxes—including the totals—it can be much larger. Indeed, it is not uncommon for the GFS and OECD to report total tax figures that are as much as 1-1.5% of GDP apart. It is difficult to identify any systematic reason for such discrepancies; different countries' revenues would appear to simply be classed differently between the GFS and OECD. This might, for example, be a result of certain revenues being classed as tax in one dataset and non-tax in another or as a payroll tax in one and as a social contribution in another. However, why the *total revenue* figures differ between countries remains unclear, especially in OECD or advanced economies, where one would assume that data quality and reporting is, on average, of a higher standard.

2008	£98,319m	£14,436m	£8,991m	£23,427m	£121,746m	£122,564m	£98,319m	£24,245m
2009	£94,445m	£15,218m	£10,156m	£25,374m	£119,819m	£120,683m	£94,445m	£26,238m
2010	£97,346m	£15,316m	£10,357m	£25,673m	£123,019m	£123,828m	£97,346m	£26,482m

Source: Author's calculation based on OECD (2017) and IMF (2017)

2.2 The Social Security Funds level of Government

A larger inconsistency arises with how governments organise collection of their social security contributions and subsequently report to the GFS or OECD. As per the 2008 System of National Accounts (SNA2008)—and, by extension, GFSM 2014—social security funds can be organised (i) as a separate subsector of the general government sector or (ii) according to the level of government at which they are organized, managed and collected (UN, 2009: 82). Countries are free to administer their social contributions according to either method. Figures 1 and 2 highlight how revenues are classified in the GFS and OECD systems respectively. [5]

Figure 1. Classification of government levels, IMF GFSM (2014)

Source: Author's illustration based on IMF GFSM (IMF, 2014)

Thus, to arrive at the General Government figure for Social Contributions in the GFS, one would sum 'Social Contributions' from each of the *Central*, *State*, *Local* and *Social Security Funds* levels of government. The same is true for the OECD, although the names of the levels of government differ

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[5] The definitions of these sectors can be found in the GFSM 2014, beginning section 2.76.

[6] See section 2.3.2 for a discussion of how to interpret a 'tax' collected at the Social Security Funds level.

slightly. Countries vary greatly in their social contributions reporting methods, with some reporting entirely at the 'Central Government' level (e.g. Iceland and Norway), whilst others report entirely at the 'Social Security Funds' level of government. It is uncommon, but not unheard of, that large amounts of social contributions are also recorded at the 'State' or 'Local level'.

Figure 2. Classification of government levels, OECD Revenue Statistics (2017).

Total (General Government)	Supranational	Tax **Social Contributions**
	Federal/ Central	Tax **Social Contributions**
	State/Regional	Tax **Social Contributions**
	Local Government	Tax **Social Contributions**
	Social Security Funds	Tax **Social Contributions**

Source: Author's illustration based on OECD Revenue Statistics (2017)

A first complication here arises with data from the GFS. As of 2017, when querying the GFS on http://data.imf.org, the user can select from the following subsectors of government:

(i)   General
(ii)   Central, (excl. Social Security Funds)
a.   Budgetary central
b.   Extra budgetary central
(iii)   State
(iv)   Local
(v)   Social Security Funds
(vi)   Central (incl. Social Security Funds).

Looking at data from (ii) and (vi) can be somewhat confusing. Total Revenue from *Central (incl. social security funds)* pertains to **'Central'** from figure 1 (which may well include social security contributions collected at this level) **+ 'Social Security Funds'** from figure 1. This means that the Social Contributions figure for (vi) will be equal to (ii) Central + (v) Social Security Funds. Strictly speaking,

then, if one wishes to find only the amount of social contributions reported at the central government level, they should use the figure from (ii). There has, until now, been a lack of consistency in how the GRD Central government data that comes from the GFS has accounted for social contributions; in some countries, 'Central' comes from (ii), in others, (ii,a) and in others (vi). This inconsistency is corrected in the 2017 GRD; more details are provided below.

A second complication arises from the fact that—aside from countries varying in the level at which they organise and report social contributions—the way in which this data is presented in the OECD *Revenue Statistics* and IMF GFS is also inconsistent. A simple exposition is useful – table 2 again displays the UK's Social Contributions figures for the period 2006–10, disaggregated by level of government. The OECD's *Revenue Statistics* classifies 100% of social security contributions at the *Social Security Funds* level of government, whilst the IMF GFS classifies these mostly at the *Central*, with some at the *Local Government* level. The GFSdoes not classify any social contributions at the 'Social Security Funds' level of government. Thus, if one were to download Central Government statistics from the two sources, the figure for social security contributions would differ wildly (being zero in the OECD and close to the total of social security in the GFS). Of course, this is one of the more extreme examples, but it illustrates the wider point which applies to many countries. Table 3 shows the same comparison for Canada and, as is clear, the two sources align more closely. However, care needs to be taken when accessing 'Central' government statistics from the GFS, as the 'Central (incl. Social Security Funds)' column is potentially misleading, as discussed above: this contains both social security contributions collected at the central government *and* at the social security funds level – but not the state level, which in Canada represents a non-negligible amount.

Table 2. Comparison of Social contributions. UK 2006–10, by level of Government, Current GBP

OECD REVENUE STATISTICS						
Year	Supranational	Federal / Central	State Regional	Local Gov't	Social Security Funds	General
2006	£0	£0	N/A	£0	£110,314m	£110,314m
2007	£0	£0	N/A	£0	£115,344	£115,344
2008	£0	£0	N/A	£0	£121,746	£121,746
2009	£0	£0	N/A	£0	£119,819	£119,819
2010	£0	£0	N/A	£0	£123,019	£123,019
IMF GFS						
Year	-	Budgetary Central	State	Local	Social Security Funds	General	Central (incl. SSF)
2006	-	£107,655m	N/A	£3,383m	£0	£111,038m	£107,655m
2007	-	£112,509m	N/A	£3,598m	£0	£116,107m	£112,509m
2008	-	£118,392m	N/A	£4,172m	£0	£122,564m	£118,392m
2009	-	£116,004m	N/A	£4,679m	£0	£120,683m	£116,004m
2010	-	£119,336m	N/A	£4,492m	£0	£123,828m	£119,336m

Source: Author's calculation based on OECD (2017) and IMF (2017)

Table 3. Comparison of Social contributions. Canada 2010–14, by level of Government. Current CAN$.

OECD REVENUE STATISTICS						
Year	Supranational	Federal / Central	State/ Regional	Local	Social Security Funds	General
2010	-	$17,869m	$11,680m	0	$47,238m	$76,787m
2011	-	$18,627m	$12,643m	0	$49,243m	$80,513m
2012	-	$19,994m	$13,334m	0	$52,538m	$85,866m
2013	-	$22,126m	$13,446m	0	$54,017m	$89,589m
2014	-	$22,896m	$13,800m	0	$56,880m	$93,576m
IMF GFS						
Year	-	Budgetary Central	State	Local	Social Security Funds	General	Central (incl. SSF)
2010	-	$17,731m	$10,743m	£0	$47,238m	$75,712m	$64,969m
2011	-	$18,485m	$11,691m	£0	$49,243m	$79,419m	$67,728m
2012	-	$19,851m	$12,374m	£0	$52,538m	$84,763m	$72,389m
2013	-	$22,075m	$12,402m	£0	$54,748m	$89,225m	$76,823m
2014	-	$22,748m	$12,562m	£0	$56,880m	$92,190m	$79,628m

Source: Author's calculation based on OECD (2017) and IMF (2017)

On a more positive note, social security funds from both sources appear to be accounting for the same revenues: as Tables 2 and 3 display, the totals (i.e. General Government) from both sources are extremely close.

With all of this in mind, the Central Government 'Social Contributions' data in the 2017 version of the GRD includes **only those Social Contributions collected/reported at the Central government level**.[7] This helps to ensure that we are as systematic as possible in how we account for social contributions at the central government level.[8] However it does mean that, for some countries, the Central government social contributions figure (and thus revenue, tax and direct tax inclusive of social contributions) will be somewhat different to that in previous iterations of the GRD which, due to the complexities noted above, were not always as systematic in how social contributions were recorded. This new classification helps to ensure that 'Central' government data from the OECD and GFS are comparable to one another. i.e. the 2017 GRD never includes 'Central (incl. social security funds)'.

The downside with this approach is that for a small number of countries (those underlined in footnote 9), the total revenue figure in 'Merged' will now be somewhat lower than before and thus understate the amount of government revenue that *we know* to be collected. i.e. whenever the GRD includes Central, as opposed to General, in the 'Merged' dataset, this is usually because the latter is not reported. This, in itself, is imperfect, because there are undoubtedly cases where countries report Central, but

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[7] i.e. at the 'Federal/Central' level from OECD *Revenue Statistics* and the 'Budgetary Central'/ 'Central Government 'excl. social security funds)' level from the IMF GFS.

[8] The countries affected are: Bulgaria, Bahrain, Belarus, Bolivia, Costa Rica, Estonia, Greece, Croatia, Hungary, Iran, Iceland, Israel, Jamaica, Korea, Rep., Lebanon, Macao, Morocco, Moldova, Mauritius, Malaysia, Nicaragua, Norway, Peru, Paraguay, Romania, Serbia, Rep., Slovenia, Seychelles, Thailand, Tunisia, Ukraine, Uruguay, Uzbekistan. Only those underlined, however, will change in the 'Merged' file of the GRD; the majority of the countries (i.e. those not underlined) will only see very marginal changes, or change only in the underlying 'Central Government' file.

also collect at the Local, State or Social Security Funds levels, but do not report these to the GFS.[9] In cases where a country collects almost all tax revenue at the Central government level and all social contributions at the Social Security Funds level, then 'Central (including social security funds)' from the GFS will actually give a reasonably complete picture of total government finances and is arguably a close approximation to 'General'. However, it is **not** comparable with Central data from the OECD.

In cases where any two sources differ in the levels of government at which Social Contributions are declared (as per the UK example in Table 2), we flag these observations and alert users to this in the notes accompanying the data. This is discussed further in section 2.4 below.

2.3   Further inconsistencies

This section describes a number of further issues with the recording of social contributions arising, not from the sources, but from how individual countries handle the funding of social security funds.

2.3.1 The distinction between social security contributions and taxes

The first inconsistency applies to cases where social security is funded by a mixture of social contributions and taxes. For example, both the OECD *Revenue Statistics* and IMF GFS (and, by extension, the GRD which uses OECD data) show that Denmark collects Social Contributions amounting to around 1% or less of GDP. Yet personal income tax (PIT) receipts are over 25% of GDP, half of Denmark's total tax revenue. Closer inspection of the disaggregated tables from the OECD show that a significant portion of Denmark's PIT receipts come from an item termed '*Labour Market Contributions*'. Why these are not classified or recorded as social contributions is not clear, but is likely due to the particular nuances of the Danish tax system.[10] It is only possible to identify cases like this from the OECD's *Revenue Statistics* individual country tables and thus, there may be other cases where social security funds are funded via taxes, particularly in developing countries where the GRD data often comes from Article IV Country Reports and the level of disaggregation is usually relatively poor. However, at this point we simply cannot always be sure where this is the case.

2.3.2 'Taxes' recorded at the Social Security Funds level of Government

A second issue, which intersects points 2.2 and 2.3.1, is that a small number of countries collect and report *taxes* at the Social Security Funds level of government.[11] For example, in France, the *Contribution à la Réduction de la Dette Sociale* (CRDS) is a tax created to '…reduce the debt of the social security [fund]' (vie-publique.fr, 2016). The CRDS is levied not only on income, but on the sales of certain goods and services (specifically, fine art and precious metals). The majority of this is administered at the 'Social Security Funds' level of government, meaning that there is, somewhat confusingly, an entry for *Taxes on Goods and Services* at this level. The classification of taxes as such is not particularly problematic for the GRD as the amounts are always small (apart from in France, where it represents

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[9] Indeed, a country could report at, for example, Central, State and Social Security Funds level, but there would be no General figure in the GFS, because 'Local', which could be small / negligible is missing.

[10] NB. As the general approach of the GRD is one of caution in the face of uncertainty, we do not, for example, shift the 'Labour Market Contribution' of Denmark into the 'Social Contributions' column.

[11] Our understanding of this issue was greatly clarified by Michelle Harding at the OECD.

a significant chunk of government revenue in recent years[12]), but the issue is nonetheless worth noting, should users wonder as to the origins of 'taxes' that are collected at the 'Social Security Funds' level of government.

2.3.3 Compulsory contributions to the Private Sector

A third inconsistency arises in countries where the social security system is structured in such a way that taxpayers are required to make contributions to a private-sector social security system, which do not show up in government budget accounts. This issue was brought to light due to the *Financing of Social Security benefits* tables available on stats.oecd.org, which disaggregates the financing of social security according to:

(i) social contributions;
(ii) other taxes (these are akin to the labour market contributions in Denmark or the CRDS in France);
(iii) voluntary contributions to government (as discussed in Section 2.1 above);
(iv) compulsory contributions to the private sector.

It is item (iv) to which we refer here. This was only identified to be present for a small number of countries, but often the amounts are non-negligible.[13] For example, Switzerland's *Compulsory Contributions to the Private Sector* for 2014 are in the region of 7.95per cent of GDP; Switzerland's 'social contributions' were just 6.6 per cent of GDP in the same year. Thus, it would be incorrect to look at the numbers for social contributions and say that Switzerland collects just half as much as, e.g., Italy (13per cent of GDP in 2014): In truth, Switzerland collects slightly more, but due to the differences in how Social Security is funded, less than half actually ends up in the General Government accounts.[14]

2.3.4 Taxes on Payroll and Workforce

As noted in Prichard *et al.* (2014)*,* in some countries it is unclear whether certain revenues should be classified as Social Contributions or Taxes on Payroll and Workforce. To the best of our knowledge, the IMF GFS and OECD *Revenue Statistics* are quite compatible in how this is reported (at least, within any one country), making any potential discrepancies hard to spot. However, Sweden stands out as
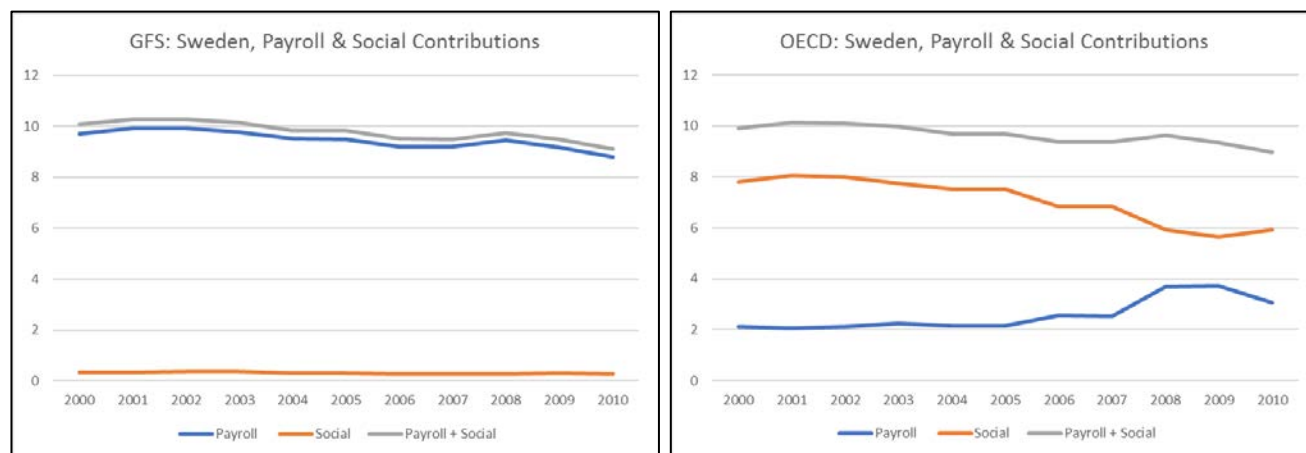
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[12] NB. it would appear to be entirely up to the individual country as to which level of government Social Contributions (or taxes like those mentioned here, which clearly go to fund Social Security) are administered at.

[13] The countries where this was identified as being present are Chile, Iceland, Netherlands (pre-2006) and Switzerland. The data suggests that such contributions also exist in the Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Israel, Mexico, Norway, Slovakia and the UK, but the amounts were, on average, <1% of GDP per year and thus not deemed large enough to cause any significant distortions when making cross-country comparisons.

[14] The 'Contributions to Private Sector' referred to here for Switzerland would appear to correspond to the *Second Pillar* (more info at https://www.bsv.admin.ch/bsv/en/home/social-insurance/bv/grundlagen-und-gesetze/grundlagen/sinn-und-zweck.html; accessed on 2 November 2017).

one example where there appears to be some discontinuity between the two sources themselves: Figure 3 illustrates:[15]

Figure 3. Comparison of Sweden Payroll Taxes and Social Contributions (% of GDP); Central Government, 2000–10.

Source*:* Author's illustration based on revenue data from IMF (2017) & OECD (2017); GDP data from IMF World Economic Outlook (March 2017 version).

As is clear, the two totals, i.e. the sum of Payroll and Social Contributions, are almost identical (they are within 0.2 per cent of GDP of each other), but the relative shares of Payroll and Social Contributions are quite different between the two sources. Thus, any conclusions over Sweden's Central Government 'Taxes exclusive of social contributions' figure will differ by almost 10 per cent of GDP, depending on the source employed.

2.4   Consequences for cross-country comparisons

Together, these inconsistencies point to a number of important conclusions for the GRD and, indeed, tax statistics more widely. Users of cross-country data must consider the trade-offs when deciding whether to compare 'taxes *inclusive* of social contributions', or 'taxes *exclusive* of social contributions'. There is no one correct answer to the question of which should be employed when referring to the *tax ratio*. The illustrations herein have shown that, for OECD countries, the most 'valid' cross-country comparisons could probably be made using the variable inclusive of social contributions, at the General government level. Whether social security is financed by social contributions or taxes, and no matter the sub-level of government these are recorded at, the totals will still be comparable. The only limitation here applies to countries where compulsory contributions are made to the private sector; their social contributions will be lower than in other countries, where social security contributions flow entirely through the general government. This applies to, we believe, just a small number of countries. Similarly, we have identified those countries where cross-country comparisons of 'Taxes exclusive of social contributions' at the General Government level are less reliable, due to, for

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[15] A separate issue with the Swedish data is that, as of 1998, there is a break in how social contributions data is reported (i.e. a reallocation away from the 'Social Security Funds' level of government toward Central Government), however this is noted in the dataset and not discussed in detail here.

example, the *labour market contributions* in Denmark or the *CRDS* in France. For example, consider a comparison of the tax ratio in Denmark and the UK. The OECD *Revenue Statistics* suggest that 'Taxes excluding social contributions' are 47.9 per cent of GDP in Denmark and 26.67 per cent in the UK (2013). However, 4.4% of the Danish figure is the *Labour Market Contribution*. In the UK, however, Social Contributions stood at around 6.6 per cent of GDP in 2013 (Denmark's were 0.8 per cent). So, any cross-country comparisons of 'taxes excluding social contributions' in these two countries, will be somewhat misguided. To say that Denmark collects almost twice as much in Taxes (exclusive of social contributions) as the UK, whilst *technically* correct, is *analytically* incorrect. This is somewhat frustrating, as 'Taxes excluding social contributions' is the variable that researchers are most often interested in (this pertains to the 'Taxes variable' from the GFS). And due to extensive missing data in poorer countries, it is the variable that might be best employed when making comparisons across a larger group.

Cross-country comparisons of 'Direct Taxes exclusive of social contributions'[16] are also problematic, because (i) occasionally, as in Denmark, some forms of income tax are present *in lieu* of social security contributions and (ii) as in Sweden, there is a lack of clarity over what constitutes a payroll tax and what constitutes a social contribution. The 'Direct Taxes inclusive of Social Contributions', however, may be more comparable across OECD countries as the aforementioned classification problems would not impact this measure. However, point 2.3.3 (where compulsory contributions to private sector exist) would still create a degree of inconsistency for a small number of countries.

At the *Central Government* level, comparisons are more problematic still. In addition to the above arguments, there are also cases like that highlighted in Table 2 – where the GFS and OECD *Revenue Statistics* simply classify social contributions at different levels of government. Where the two sources differ, it is most often the case that the GFS reports some at the Budgetary Central Government level, whilst the OECD *Revenue Statistics* reports this at the Social Security Funds level of government.[17]

In terms of non-OECD and developing countries, the solution is not so clear-cut: it is often difficult to tell – simply from looking at the data - whether social security contributions either comprise a very small amount of government revenue (and are thus not listed), or they are not collected at all. As a result, comparisons across a very heterogeneous group of countries, or within a group of low income countries, might best be made using the tax variable exclusive of social contributions. Ultimately, the user of the data should carefully consider his or her sample of countries and consult the accompanying notes in order to make as informed a choice as possible. Where results and conclusions differ dramatically according to the variable employed, the researcher should, as best as it is possible, interrogate the data for an explanation as to why this is the case.

In order to warn users of these various issues, we have inserted a new 'Flag' column in the GRD named *Caution 4: Inconsistencies with social contributions*. This is accompanied by a note, which gives details

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[16] In the GRD, Direct taxes correspond to the sum of (i) Taxes on Income Profits and Capital Gains, (ii) Taxes on Payroll and Workforce and (iii) Property Taxes. Direct is presented both inclusive and exclusive of (a) social contributions and (b) resource revenues.

[17] The cases we have identified where OECD and GFS report social contributions at differing levels of government are as follows: Canada, Germany, Greece (pre-1998), Italy, Japan, Mauritius, Netherlands, Norway (pre-2000), South Korea, Sweden, United Kingdom and the United States.

of the specific problem. Reasons for flagging the data as such will fall under one of the following categories:

One of OECD or IMF classifies social contributions at the Central government level, whilst the other does not. (NB. only where the difference between the two sources is significantly large to present a distorted view one way or the other, do we flag here. i.e. there are several cases where the data only slightly differs between the two sources; these are not flagged but a note is still inserted in the dataset). This pertains to, for example, cases such as those discussed in section 2.2.

Evidence exists that a substantial (>1per cent of GDP) amount of tax revenue is collected as a source of funding for social security (e.g. France, Denmark).

Significant (>1 per cent of GDP) payments to social security exist outside the general government accounts – that is, they are made to the private sector. **NB.** We only flag this in the 'General Government' file, as there is no way to say for sure at what level of government these revenues would otherwise be administered, if they were made to the public sector.

There is confusion across sources as to the appropriate classification of revenues between social contributions and payroll taxes.

3 Property tax

As of the GFSM 2014, the IMF has reclassified *Taxes on Financial and Capital Transactions* (TFCT) in the GFS from 'Property' into 'Goods and Services'. This is to reflect how such transactions are accounted for in SNA2008/ESA2010. All historic GFS data available online was systematically updated in 2015/16 to reflect this change. However, as of mid-2017, the OECD has not followed suit: *TFCT* remain an item under 'Property' in their *Revenue Statistics* dataset. OECD (2016:70) states that they *'...decided to retain the original classification as a tax on property in order to align with the principle of maintaining consistency with historical data series as far as it is possible to do so.'*

However, this creates a degree of inconsistency between the *Revenue Statistics* and GFS. Furthermore, it creates an inconsistency between the GFS and data from Article IV consultations. Thus, the GRD was faced with a choice:

   (i)   update the OECD data to reflect the changes in the GFS. i.e. shift *TFCT* into Taxes on Goods and Services;
   (ii) keep the OECD data as is, but shift *TFCT* back into property tax in the GFS;
   (iii) do nothing and allow an inherent inconsistency between GFS and OECD *Revenue Statistics* to remain.

Neither is the perfect choice. Whilst (ii) would mean that data from all sources classes *TFCT* as Property, it is ignoring the fact that SNA2008/ESA2010/GFSM2014 have all seen to reclassify such transactions as goods and services. Furthermore, the reason given by OECD for retaining *TFCT* as a Property tax is somewhat unsatisfactory; indeed, it would appear – at least from the outside - that the choice to do so was borne out of the inherent difficulties and resource requirements, in updating historical data series. This is understandable.

The GRD 2017 proceeds with approach (i): all OECD data (as far back as 1980, in the GRD) have been adjusted so that they are in line with the GFS – i.e. *TFCT* have been subtracted from Property and added to Goods and Services. This does imply that older data, from Article IV staff consultations might be somewhat incompatible with GFS or OECD *Revenue Statistics* data. However, we assume that all Article IV data compiled under GFSM2014 standards (i.e. in recent years and going forward) will reflect this change.[18] It was felt important to make this change because of the increased attention on property taxation in the developing world and as such the likelihood that researchers might use this data (see e.g. Ali *et al.* 2017). Whilst property tax revenues themselves are small (even in OECD countries, the average is just 1.9% of GDP (2013)), the fraction of property tax revenue that comes from *TFCT* can often be quite large. E.g. in the OECD's *African Tax Statistics,* on average over 50 per cent of Property Tax came from the *TFCT* (indeed for countries such as Cameroon or Tunisia, the number was over 90 per cent).[19] Thus, the implications of this shift are very important for any research employing data on property taxation in developing countries. In cases where we suspect that existing property tax figures are inflated by *TFCT*, we draw attention to this in the notes columns.

4   Sales, value added and excise taxes levied on imports

One of the largest difficulties the GRD project has faced, concerns how taxes on international trade and transactions are collected and reported by developing countries. This was acknowledged with the launch of the GRD and, the problem has, unfortunately, persisted until now. Prichard *et al.* (2014) discuss this on pages 31-2 of their working paper and their original assertion is still true with the GRD 2017: the GRD strives to ensure consistency *within* countries over time, but the rules followed *between* countries might differ somewhat. Some more detail is provided here:

The particular problem usually only applies where underlying data is drawn from Article IV staff reports, which often list a figure for 'Taxes on International Trade and Transactions' that is inclusive of VAT or sales tax collected at the border. Most likely this inconsistency arises according to whether or not VAT on imports is collected by the customs authority – in which case it will be classed as a trade tax. This is problematic for the GRD because, as per the IMF's GFSM2014 and the OECD *Revenue Statistics* Interpretive Guide, all VAT and sales tax, whether levied on domestically produced or imported goods should be classified as *Taxes on Goods and Services.* The problem, of course, is that much of the data appearing in Article IV staff reports is not presented according to these accounting rules. Depending on the level of disaggregation provided and the availability of other sources, the 2017 GRD has systematically corrected for the presence of value added/sales/excise taxes collected on imports. Benin provides an interesting example of how this is achieved in practice (see Table 13, pg. 42 of IMF, 2008). Since the disaggregation of tax revenues in the Article IV report is good for Benin, we are able to identify the portion of Trade Tax revenue that comes from VAT and move this into Taxes on Goods and Services. Comparing the few years where this well-disaggregated Article IV data overlaps with GFS data suggests that this approach is valid. There are, however, other cases where the GRD cannot be so succinct. For example, with Togo's data, we know that *Trade* is inflated by *Sales*

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[18] NB. The tax data reported in Article IV consultations is not necessarily compiled in line with GFSM standards, however some countries do this.

[19] The numbers are of a similar magnitude for OECD member countries.

Tax / VAT and that *Goods and Services* is thus lower than it might be under GFSM accounting rules. In this case, the disaggregates for 'Trade' and 'Goods and Services' have been removed. As per Prichard *et al.* (2014), the figure for 'Indirect' (which is the sum of *Goods and Services*, *Trade* and *Other*) should be 'correct' in all such examples and cross-country comparisons using this variable, entirely valid.

In the vast majority of cases, this correction was possible without any loss of disaggregation, although in a handful of countries, such as Togo, some disaggregates have been removed. Thus, the approach to sales taxes collected on imports in the GRD 2017 is consistent both *within* and *between* countries. There is slightly less certainty surrounding excises collected on imports as these are not always systematically reported as a subheading of trade. However, in cases where some doubt exists, we alert users to this via the notes column.

5   Notes and flags

It has always been the approach of the GRD to urge caution where some observations are potentially misleading. In the 2017 version, the notes columns have been thoroughly revised, in order to ensure that they are more useful and more accessible for users. As outlined above, we have incorporated a new flag for cases where inconsistencies surround the treatment of social contributions (either across sources or across countries). This is in addition to the existing flags, which pertain to cases where (i) the data is of questionable accuracy, quality of comparability and (ii) resource revenues are either significant or marginal, but cannot be isolated from the reported totals. Users, as always, are advised to consult these flags and notes and carefully consider the implications of including data that the GRD suggests is potentially problematic in their research and analyses.

6   Conclusion

This paper has outlined some of the ongoing issues surrounding the construction of the Government Revenue Dataset. Any efforts to synthesize revenue statistics from multiple sources come with inherent difficulties. The GRD has already overcome numerous hurdles to this point. However, in so far as the issues identified herein have helped to iron out some more of those inconsistencies, we are confident that the GRD remains the most accurate and transparent choice for those using cross-country revenue data. Other datasets do not, at this point, make the corrections identified herein. The usual warnings over the quality or accuracy of the underlying data remain. The GRD strives to present publicly available data from multiple sources in as coherent and cohesive a manner as possible, informing users of the potential weaknesses where these have been identified. As should hopefully be clear, revenue data is inherently difficult to analyse and can systematically differ in its construction from source to source and from country to country. However, along with the notes contained in the dataset, the online user guide, and the initial working paper (Prichard *et al.* 2014), it is hoped that this paper can help users to better understand, and more appropriately make use of, cross-country tax statistics.

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Appendix

Existing differences between the IMF GFS and OECD *Revenue Statistics*

There are several notable differences in the GFS and OECD *Revenue Statistics* presentations of government revenues. In summary:

(i) The GFS presents Total Revenue, Tax Revenue, Non-Tax Revenue, Social Contributions and Grants data. The OECD *Revenue Statistics* report Total Tax (which is inclusive of Social Contributions) and also Total Revenue in their 'General Government Accounts', but does not systematically report Grants or Non-tax Revenue. Thus, the GRD where it uses OECD data, calculates Non-Tax Revenue as Total Revenue – (Tax including Social Contributions). The assumption is often that Grants =0, unless there is good reason to believe otherwise (i.e. an auxiliary source suggesting a non-zero figure for grants).

(ii) The OECD *Revenue Statistics* classify Taxes on International Trade and Transactions as a subcategory of Taxes on Goods and Services. The IMF GFS classify these as two separate items. The GRD follows the GFS approach, making the necessary calculations on OECD data where necessary.

(iii) As mentioned in (i), The OECD's *Revenue Statistics* include Social Contributions as a part of Tax. The GRD presents tax revenues both inclusive and exclusive of social contributions.